

U.S. Department of Energy  
Technical Qualification Program

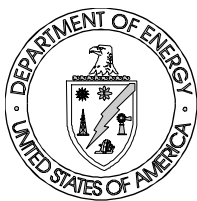
# *Emergency Management Topical Area*

## **Study Guide**

**For the**

*Facility Representative  
Qualification Standard*

**May 1996**



**Competency 4.3 A Facility Representative shall demonstrate a working level knowledge of the Department of Energy emergency management system and response practices.**

**1. Supporting Knowledge and Skills**

- a. Describe the key elements of Emergency Preparedness including planning, operations, principles, and methods.
- b. Explain the Facility Representative's role and responsibilities associated with emergency management and response to unplanned events.
- c. Explain the difference between the Occurrence Reporting and Processing System notification requirements and Emergency Management Systems event classification and notification requirements.

**2. Self-Study Activities (corresponding to the intent of the above competency)**

- NOTES:
- The DOE Orders are in a state of transition. Please refer to the following gopher site for a cross reference of new and old Orders:  
gopher://VM1.HQADMIN.DOE.GOV:70/00/doemenu1/directiv/251cross.asc
  - Below are two web sites containing many of the references you may need.

Web Sites		
Organization	Site Location	Notes
Department of Energy	<a href="http://cted.inel.gov/cted/index.html">http://cted.inel.gov/cted/index.html</a>	DOE Standards, Guides, and Orders.
U.S. House of Representatives	<a href="http://law.house.gov/cfr.htm">http://law.house.gov/cfr.htm</a>	Searchable Code of Federal Regulations

**Read** the DOE policy and concept of emergency operations (pages 2 though 7), and **scan** the responsibilities section (pages 7 through 29) DOE Order 5500.1B, *Emergency Management System*.

**EXERCISE 4.3-A** In general terms, describe DOE's emergency management policy, planning, preparedness, and response.



- EXERCISE 4.3-B      What is the primary responsibility of each of the following key emergency response positions:
- The director of the Headquarters Emergency Management Team (HQ) (EMT)
  - Head of the field element
  - Facility representative
- EXERCISE 4.3-C      Describe how planning and preparedness activities can help to ensure a successful emergency response.
- EXERCISE 4.3-D      Using DOE 5500.1B, what is the composition and the purpose of the HQ EMT

**Read** DOE Order 5000.3B, *Occurrence Reporting and Processing of Operations Information*, **read** DOE Order 5500.2B, *Emergency Categories, Classes, and Notification and Reporting Requirements*, and **read** pages 1 through 9 in the Guidance for Event Classification and Emergency Action Levels in U.S. Department of Energy, Office of Emergency Planning and Operations, *Emergency Management Guide*.

- EXERCISE 4.3-E      Explain the conceptual differences and relationship between “occurrence reporting” and “notification” as contained in DOE Order 5000.3B, *Occurrence Reporting and Processing of Operations Information*, and DOE Order 5500.2B, *Emergency Categories, Classes, and Notification and Reporting Requirements*.
- EXERCISE 4.3-F      Briefly describe the major elements of a site/facility emergency plan.

### 3. Summary

The following DOE Orders establish the Department's Emergency Management System (EMS):

DOE Order 5500.1B establishes the overall policy and requirements of the EMS. The Order states that the Under Secretary is the senior official for the EMS and convenes the HQ EMT. The HQ EMT is a team formed to manage response actions during emergencies involving DOE facilities or requiring DOE assistance. The Emergency Management Advisory Committee (EMAC) is also established by this Order and supports the Director of Emergency Operations (DEO) in the development of specific policy and technical recommendations. Specific responsibilities are spelled out in this Order for facility managers, heads of Field Elements, and Headquarters Program Secretarial Officers (Program Senior Officials - PSOs).



DOE Order 5500.2B establishes standard terminology for operational and energy emergencies. Operational emergencies are further classified as an Alert, a Site Area Emergency, or General Emergency according to the severity of the impact of the event. This Order also establishes a reporting requirement for emergency events.

DOE Order 5500.3A establishes the hazards assessment as the technical basis upon which all emergency management programs are developed. The Order states the requirements for planning and preparedness for operational emergencies and describes the thirteen program elements of an emergency management program.

DOE Order 5500.7B, Emergency Operating Records Protection Program, establishes policies, responsibilities, and requirements to ensure the safeguarding the core of records deemed necessary to ensure continuity of governmental activities following disasters and attack-related emergency conditions. The Order provides regulatory guidance on acceptable storage locations, manner of storage, and disposition of emergency operating records.

DOE Order 5500.10 establishes requirements for the Emergency Readiness Assurance Program, the goal of which is to ensure that the EMS is ready to respond promptly, efficiently, and effectively to any emergency involving DOE facilities or requiring DOE assistance. The program includes a requirement for development of a 5-year Emergency Readiness Assurance Plan (ERAP). The Order requires an appraisal program to ensure that stated emergency capabilities are sufficient to implement emergency plans and that appropriate and timely improvements are made.

#### **4. Exercise Solutions**

**EXERCISE 4.3-A**      In general terms, describe DOE's emergency management policy, planning, preparedness, and response.

**ANSWER 4.3-A**      Policy - develop and maintain an emergency management system capable of responding to and mitigating the consequences of various emergencies

Planning - develop emergency plans and procedures, identify personnel, equipment, and other resources

Preparedness - acquire and maintain the above resources, train the personnel, and assessing and exercising the emergency plans and procedures



Response - during an actual emergency, implement plans and preparedness make effective decisions, take actions, apply resources to mitigate the consequences, and recover from the emergency

EXERCISE 4.3-B      What is the primary responsibility of each of the following key emergency response positions:

- the director of the HQ EMT
- head of the field element
- facility representative

ANSWER 4.3-B      1. The director of the HQ EMT - to provide guidance and direction for the EMT and serve as HQ's principal POC for external offices and agencies

2. Head of the field element - to establish and maintain an effective, integrated emergency preparedness program

3. Facility representative - to continue oversight of the contractor and to perform emergency management activities as directed by DOE management

EXERCISE 4.3-C      Describe how planning and preparedness activities can help to ensure a successful emergency response.

ANSWER 4.3-C      Planning includes development and preparation of plans and procedures to ensure an effective emergency response. Preparedness activities ensure that plans and procedures are adequate and valid, that equipment and facilities are available for emergency response, and that personnel are trained to effectively implement the plans and procedures when responding to an emergency to protect workers, the public and the environment.



EXERCISE 4.3-D Using DOE 5500.1B, what is the composition and the purpose of the HQ EMT?

ANSWER 4.3-D The HQ EMT, consisting of an executive team and a technical operations cadre, provides management and direction of emergency response activities. Specifically, the executive team provides strategic direction to the response and evaluates the impact of the emergency upon the Complex. The technical operations cadre provides oversight to the field element, coordinates with other Federal agencies, and provides information to the press, Congress, and other Federal agencies.

EXERCISE 4.3-E Explain the conceptual differences and relationship between “occurrence reporting” and “notification” as contained in DOE Order 5000.3B, *Occurrence Reporting and Processing of Operations Information*, and DOE Order 5500.2B, *Emergency Categories, Classes, and Notification and Reporting Requirements*.

ANSWER 4.3-E The purpose of occurrence reporting under DOE Order 5000.3 is to document events and to provide for appropriate corrective action. The purpose of reporting under 5500.2B is to ensure that appropriate response actions can be undertaken and that appropriate resources are available to mitigate the emergency.

DOE Order 5000.3B provides requirements for reporting event occurrences. Reportable events are categorized as Off-Normal Occurrences, Unusual Occurrences, and Emergencies. Once an event has been categorized under 5000.3, oral notification to headquarters and offsite agencies must be made within 2 hours of categorization for an Unusual Occurrence and within 15 minutes for an Emergency; written notification is required within 80 hours of the categorization.

If an event is categorized as an Emergency, it is further classified as to Alert, Site Area, or General Emergency by 5500.2B and oral notification is required within 15 minutes of declaration of the emergency.



EXERCISE 4.3-F Briefly describe the major elements of a site/facility emergency plan.

ANSWER 4.3-F Major elements of an emergency plan include:

Introduction - Includes a statement of the purpose and scope of the plan, concept of operations, and a description of the site.

Emergency Response Organization - Describes the internal (onsite) emergency response organization, including a description of the organization, direction and control, and the emergency management operations.

Offsite Response Interface - Describes emergency response available offsite, including other federal agencies, and state, local, and tribal governments and describes the Memoranda of Agreements, Memoranda of Understanding, and Agreements in Principle for interface with these offsite groups.

Operational Emergency Event Classes - Describes the emergency action levels which trigger an emergency response and activate the emergency plan.

Notification and Communications - Describes necessary notifications and communication of those notifications during an emergency event.

Consequence Assessment - Describes the determination and calculation of potential consequences.

Protective Actions - Describes emergency planning zones, protective action guides and emergency response planning guidelines, personnel accountability and communication during an emergency event, and termination and/or shutdown.

Medical Support - Provides information of facilities, equipment, and staff available for medical support to an emergency. This section also describes any agreements for transportation and treatment of the injured by offsite agencies.

Recovery and Reentry - Discusses the termination or downgrade of the emergency as well as actions necessary for reentry and recovery.



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Public Information - Describes facilities, equipment, and mechanism for coordination of emergency public information.

Emergency Facilities and Equipment - Describes facilities and equipment available for emergency response.

Training - Describes training requirements and available training for onsite and offsite personnel.

Drills and Exercises - Describes the objectives and schedule for drills and exercises for onsite personnel and coordination with offsite agencies.

Emergency Management Program Administration - Identifies the emergency management program administrator as well as administrative controls for self-assessment.

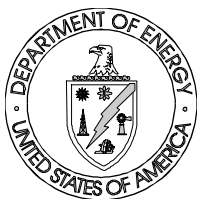




**Competency 4.6** A Facility Representative shall demonstrate a working level knowledge of the Occurrence Reporting and Processing System necessary to ensure that occurrences are properly reported and processed in accordance with DOE Order 5000.3B "Occurrence Reporting and Processing of Operations Information".

**1. Supporting Knowledge and Skills**

- a. Define the term Reportable Occurrence and using an actual facility-specific Occurrence Report and discuss the factors contributing to the Occurrence.
- b. Describe the intent and contents of DOE Order 5000.3B requirements for Notification Reports including the following:
  - Reporting Philosophy
  - Identification
  - Categorization
  - Notification Process
  - Reporting Requirements
  - Analysis
  - Root Cause Determination
  - Generic Implications
  - Corrective Action Implementation
  - Tracking
  - Closeout
- c. Explain the Facility Representative and operating contractor's responsibilities for occurrence reporting including a discussion of the following:
  - Notification Report
  - 10-Day Occurrence Report
  - Final Report
  - Closing out and verifying Occurrence Reports
  - Processing Occurrence Reports which cross lines of Facility Representative responsibility
  - Contractor Occurrence Reporting Procedures
- d. Describe the purpose of the Occurrence Reporting and Processing System Visimage Ad Hoc Reporting software and explain its use for the input of occurrence reports and how to retrieve information from the database.



- e. Given an actual Occurrence Report, determine the adequacy of the review process used, that causes were appropriately defined, that corrective actions addressed causes, that the lessons learned were communicated, that planned corrective actions were appropriate, and verify that corrective actions have been completed.
- f. Explain the Facility Representative's responsibilities associated with DOE Order 5480.29 "Employee Concerns" with respect to the identification, reporting, reviewing, and documentation of employee concerns.
- g. Discuss the process for, and importance of, applying lessons learned from Occurrence Reports to facility operations.

## 2. Self-Study Activities

- NOTES:
- The DOE Orders are in a state of transition. Please refer to the following gopher site for a cross reference of new and old Orders:  
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U.S. House of Representatives	<a href="http://law.house.gov/cfr.htm">http://law.house.gov/cfr.htm</a>	Searchable Code of Federal Regulations

**Read** DOE Order 5000.3B, *Occurrence Reporting and Processing of Operations Information*.

**Read** at least two occurrence reports involving facilities at your site.

EXERCISE 4.6-A      Define "Reportable Occurrence" and the rationale associated with reporting as identified in DOE Order 5000.3B.

EXERCISE 4.6-B      Referring to DOE Order 5000.3B, describe three categories of Reportable Occurrences and provide an example of the types of events that could lead to each.



- EXERCISE 4.6-C      Discuss time requirements for reporting occurrences.
- EXERCISE 4.6-D      Describe the elements of the occurrence report.
- EXERCISE 4.6-E      Briefly explain the main purpose of the Occurrence Reporting and Processing System (ORPS).
- EXERCISE 4.6-F      Using Attachment I of DOE Order 5000.3B, list the nine groups of categorized occurrences.
- EXERCISE 4.6-G      Differentiate between “direct cause,” “contributing cause,” and “root cause.”
- EXERCISE 4.6-H      List seven categories of causes.
- EXERCISE 4.6-I      Describe the responsibilities of the Facility Manager for occurrence categorization and reporting.
- EXERCISE 4.6-J      For the two occurrence reports you reviewed, identify and highlight the root cause and corrective action sections. How will facility management know if the corrective action is actually “correct”?
- EXERCISE 4.6-K      For the reports you reviewed, locate the corrective action entry in the facility’s commitment tracking system, and verify its current status. If it is closed, review and verify the closeout documentation.

### **3. Summary**

DOE Order 5000.3B, *Occurrence Reporting and Processing of Operations Information*, establishes a system for reporting of operations information related to DOE-owned or -operated facilities and processing of that information to provide for appropriate corrective action.

The Order describes the requirements for reporting and processing of occurrences related to the operation of DOE-owned or -operated facilities, including occurrences related to safety, health, security, property, operations, or the environment, up to and including emergencies.



#### **4. Exercise Solutions**

**EXERCISE 4.6-A** Define “Reportable Occurrence” and the rationale associated with reporting as identified in DOE Order 5000.3B.

**ANSWER 4.6-A** Reportable Occurrences are events or conditions that (1) affect the health and safety of the public, (2) seriously impact the intended purpose of DOE facilities, (3) have a noticeable adverse effect on the environment, (4) endanger the health and safety of workers, or (5) adversely affect national security or the security interests of DOE.

**EXERCISE 4.6-B** Referring to DOE Order 5000.3B, describe three categories of Reportable Occurrences and provide an example of the types of events that could lead to each.

**ANSWER 4.6-B** Emergencies - The most serious occurrences; require an increased Alert status for on-site personnel and, in specified cases, for off-site authorities. Types of events that could lead to an emergency include the following:

- a) any unintentional nuclear criticality that results or could result in actual or potential facility damage or release of radioactive material to the environment;
- b) any actual or potential release of material to the environment that results or could result in significant off-site consequences;
- c) any natural or man-made event posing an actual or potential threat to the integrity of the facility that results or could result in significant off-site consequences;
- d) any even in process or having occurred which involves an actual or potential substantial degradation of the level of the safety of the facility that results or could result in significant off-site consequences;
- e) any safeguards or security event that is an actual or potential threat to DOE operations, facilities, or personnel, and results or could result in significant effects on the public health and safety/or on national security; or
- f) any event that requires activation of the site emergency plan.



Unusual Occurrence - A nonemergency event that has significant impact or potential for impact on safety, the environment, health, security, or operations. Types of events that could lead to an Unusual Occurrence include events that do the following:

- a) result in the release of radioactive or hazardous materials above limits established in, or in violation of, safety, environmental, or health requirements defined in Federal permits, Federal regulations, or DOE standards;
- b) present significant internal or external threats to safety, the environment, health protection, or the ability of a facility to operate;
- c) involve significant degradation of safety class equipment or environmental, safety, security, or health conditions;
- d) result in fatalities, exposures to hazardous or radioactive materials or off-site or on-site contamination that do not meet emergency criteria defined in DOE Order 5500.2B, but are in excess of regulatory limits, failure of environmental monitoring equipment necessary to demonstrate compliance, failure of safety equipment or systems reducing the capability below a minimum required safety function, or significant delay or cost in operations;
- e) result in the actuation of emergency systems or engineered safety features, except under approved testing;
- f) violate technical safety requirements, or involve an unreviewed safety question;
- g) violate DOE safety requirements, environmental requirements, or result in the loss of control or release of radioactive material above allowable limits;
- h) result in the release of a hazardous substance or material that exceeds a reportable quantity and is not Federally permitted as defined in Attachment I of DOE Order 5000.3B; or
- i) result in failure or significant degradation of administrative controls that are required to ensure safety, security, or environmental protection.

Off-Normal Occurrence - An abnormal or unplanned event or condition that adversely affects, potentially affects, or is indicative of degradation in the safety, security, environmental, or health protection performance or operation of a facility. Off-Normal Occurrences are those events which do the following:

- a) result in the release of radioactive or hazardous materials below limits established by Federal permits, Federal regulations, or DOE standards, but must be reported in writing to state or local agencies in other than routine monthly/quarterly reports;



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- b) are internal or external threats to safety, security, environmental, or health protection or the ability of a facility to operate;
- c) involve degradation of environmental, safety, security, or health conditions;
- d) result in serious personnel injury or significant lost workdays, personnel contamination, assimilation, exposure, or significant on-site or off-site contamination of hazardous or radioactive materials in excess of administrative limits but within regulatory limits, or degradation of environmental monitoring equipment necessary to demonstrate compliance;
- e) result in violation of safety, environmental, or health administrative limits;
- f) involve operational procedural violations, including maintenance and administrative procedures which have the potential to impact the safety, security, environmental, or health performance or operation of a facility; or
- g) involve discovery of a condition that could prevent the functioning of administrative controls necessary to ensure safety or environmental protection.

EXERCISE 4.6-C      Describe the notification requirements for Reportable Occurrences.

ANSWER 4.6-C      Emergencies - Oral notification of emergencies to DOE and off-site authorities shall be made within 15 minutes or less of categorization; a written notification report shall be prepared and submitted as soon as practical, but in all cases, before the close of the next business day from the time of categorization.

Unusual Occurrences - Oral notification to DOE shall be made as soon as sufficient information is obtained to indicate the general nature and extent of the occurrence, but in all cases, within two hours of categorization; a notification report shall be prepared and submitted before the close of the next business day from the time of categorization.

Off-Normal Occurrences - Oral notification to DOE is not mandatory; a notification report shall be prepared and submitted before the close of the next business day from the time of categorization.



EXERCISE 4.6-D Describe the required elements of the occurrence report.

ANSWER 4.6-D For every Reportable Occurrence, the Facility Manager shall determine and document the following in the occurrence report:

- a) the significance, nature, and extent of the event or condition;
- b) the cause(s) of the event or condition, including the root cause, as appropriate; and
- c) the corrective actions to be taken to correct the condition and prevent recurrence.

EXERCISE 4.6-E Briefly explain the main purpose of the ORPS.

ANSWER 4.6-E The major purpose of the Occurrence Reporting and Processing System is to provide feedback of safety and operational information identified in occurrence reports to other DOE nuclear facilities.

EXERCISE 4.6-F Using Attachment I of DOE Order 5000.3B, list the nine groups of categorized occurrences.

ANSWER 4.6-F The nine groups of categorized occurrences are:

1. Facility Condition
2. Environmental
3. Personnel Safety
4. Personnel Radiation Protection
5. Safeguards and Security
6. Transportation
7. Value Basis Reporting
8. Facility Status
9. Cross-Category Items

EXERCISE 4.6-G Differentiate between “direct cause,” “contributing cause,” and “root cause.”

ANSWER 4.6-G Direct cause - The cause that directly resulted in the occurrence.

Contributing cause - A cause that contributed to the occurrence but, by itself, would not have caused the occurrence.



Root cause - The cause that, if corrected, would prevent recurrence of this and similar occurrences.

EXERCISE 4.6-H List seven categories of causes.

ANSWER 4.6-H Categories of causes:

1. Equipment/material problem
2. Procedure problem
3. Personnel error
4. Design problem
5. Training deficiency
6. Management problem
7. External phenomenon

EXERCISE 4.6-I Identify the responsibilities of the Facility Manager in occurrence categorization and notification.

ANSWER 4.6-I Responsibilities of the Facility Manager in occurrence categorization and notification include the following:

- Categorization of the occurrence utilizing the facility-specific procedures developed in accordance with DOE Order 5000.3B.
- For oral notification, the Facility Manager shall simultaneously contact the DOE Facility Representative and the Headquarters (HQ) emergency operations center (EOC).
- Preparation and submittal of the notification report and distribution of the report to the DOE Facility Representative and Program Manager.

EXERCISE 4.6-J For the two occurrence reports you reviewed, identify and highlight the root cause and corrective action sections. How will facility management know if the corrective action is actually “correct”?

ANSWER 4.6-J Primarily by monitoring the corrective action or any performance indicators corresponding to this corrective action; also if the occurrence does not “occur” again.





**EXERCISE 4.6-K** For the reports you reviewed, locate the corrective action entry in the facility's commitment tracking system, and verify its current status. If it is closed, review and verify the closeout documentation.

**ANSWER 4.6-K** The answer is facility-specific.